RESPONSIBILITIES OF CARDIOLOGY FELLOWS IN THE
CARDIAC INTENSIVE CARE UNIT

I. CCU Rotation:

a. The cardiology fellow assigned to the **Cardiac Intensive Care Unit** is expected to be available to supervise and provide consultation for medical residents on the CCU rotation beginning at 7:30 a.m. each day until 5:00 p.m., except when post-call (note: on post-call days, the CCU fellow is to sign out to a previously designated covering fellow by 1:00 p.m.; the covering fellow is to be available to the CCU until 5:00 p.m. or until relieved by that day's on-call fellow). The cardiology fellow will take Saturday or Sunday as a day off, as previously arranged with the CCU Attending at that time. There are to be no other vacation or meeting days taken during the CCU rotation, unless appropriate coverage is agreed to in advance with the CCU Attending and the Medical Director.

b. The cardiology fellow assigned to the CCU is responsible for performing or supervising all invasive procedures, including the placement of temporary pacemakers, triple lumen catheters, and pulmonary artery catheters. For placement of pacemakers or pulmonary artery catheters, the cardiology fellow must personally perform or supervise/assist the procedure when performed by a medical resident. For placement of triple lumen catheters, the cardiology fellow may supervise the procedure but does not have to scrub. The cardiology fellow in the CCU is responsible for the safe removal of intra-aortic balloon pump catheters that were inserted in the CCU.

c. The cardiology fellow in the CCU is responsible for ensuring that all procedures performed in the CCU follow strict sterile guidelines for aseptic technique, including a minimum of a 3 minute sterile scrub, use of cap mask, gown, and strict adherence to sterile procedures at all times. The cardiology fellow in the CCU is directly responsible for ensuring appropriate use of fluoroscopy during cardiac procedures. The cardiology fellow is responsible for promptly reporting any and all complications encountered during invasive procedures to the CCU Attending, the Medical Director, and risk management when appropriate.

d. The cardiology fellow in the CCU is responsible for promptly evaluating all CCU admissions, and will be available to the Emergency Department or any service outside the CCU from 7:30 a.m. to 5:00 p.m. for emergency evaluations of all patients with acute myocardial infarction, severe unstable coronary artery disease, cardiogenic shock, cardiac arrest, or similar cardiac emergency prompting likely CCU admission. To facilitate timely availability to the Emergency Department or other outside services, the cardiology fellow will carry the **AMI pager (253-1579)** at all times during the day. The cardiology fellow in the CCU is responsible for responding to the AMI pager as soon as possible, no longer than 2 minutes after a page. If scrubbed in a procedure or otherwise not available, it remains the CCU fellow's responsibility to notify the CCU Attending or cardiology consult fellow of the immediate need to respond to the AMI page received. The cardiology fellow is also expected to be familiar with the active acute care cardiology clinical trials and is requested to notify the CCU coordinator or other appropriate research coordinator of eligible patients to be screened for inclusion into clinical trial protocols.

e. The cardiology fellow in the CCU is responsible for notifying the CCU Attending of all admissions to the CCU in a timely manner. To facilitate CCU patient care, the cardiology fellow in the CCU should meet daily with the CCU charge nurse between 7:30 and 8:00 a.m. to identify any patients who may potentially be transferred from the CCU that day; patient transfers will require final approval by the attending physician.

f. The cardiology fellow is also expected to attend cardiology core conferences, Cardiology Grand Rounds, and other scheduled meetings unless involved in an emergency procedure. The critical care fellow or CCU Attending assigned to the CCU will act as a back-up for the cardiology fellow during required scheduled teaching activities.

g. The cardiology fellow is expected to meet with the new interns and residents on the first day of their rotation in the CCU in order to review CCU organization, logistics, and curriculum. Given the critical role in supervising CCU house staff, the CCU fellow is also expected to report any performance issues encountered with CCU interns and residents promptly to the CCU Attending and/or Medical Director.

h. The cardiology fellow in the CCU is responsible for providing a limited series of didactic presentations to the CCU house staff on core critical care cardiology topics that have been previously prepared and archived. The fellow should organize the timing of these presentations (generally 1 or 2 per week, timed after completion of morning rounds) over the course of the rotation.

i. During the CCU rotation, the cardiology fellow will have no other clinical or research responsibilities unless approved by the CCU Medical Director.

j. In circumstances where the cardiology fellow is unable to meet all of his or her direct responsibilities, the CCU Attending and the CCU Medical Director should be immediately notified. It remains the responsibility of the cardiology fellow in the CCU to arrange appropriate back-up coverage.

II. On Call Responsibilities for the CCU:

a. The cardiology fellow on call will provide primary coverage for the CCU from 5:00 p.m. to 7:30 a.m. the following day. This coverage will include timely evaluation of all the patients with acute myocardial infarction unstable coronary syndromes, or cardiac emergencies who present to the emergency room, and of all admissions to the CCU. The fellow will be notified immediately by the CCU triage nurse via page of any new admission(s) to the CCU. The fellow is responsible for promptly and directly evaluating any new patient admitted to the CCU or any significant problem developing in a CCU patient, *in person*. The fellow will also be responsible for promptly communicating any findings or problems regarding CCU patients to the CCU Attending and to the patient's primary attending when appropriate.

b. To facilitate availability to the Emergency Department, the cardiology fellow on call will carry the **AMI pager (253-1579).** The cardiology fellow on call should ensure primary availability for emergency evaluations in the Emergency Department or CCU at all times. The cardiology fellow on call is responsible for responding to the AMI pager as soon as possible, and no longer than 2 minutes after a page. The current protocol regarding the recommended management for patients presenting to Barnes-Jewish Hospital with ST-elevation acute myocardial infarction is included in section III below. For the management of any patient with acute myocardial infarction who is a candidate for reperfusion therapy *when the decision for reperfusion has not already been determined by the ED Attending* (typically in conjunction with the on call Interventional Cardiology Attending), the cardiology fellow on call will immediately communicate with the on call Interventional Attending such that a recommendation regarding acute reperfusion therapy may be provided without delay. Following determination of reperfusion strategy, the CCU Attending should also be notified. *The fellow is then to be physically present in a timely manner to assist in directing the further evaluation and management of such patients, including assisting in preparation for emergency catheterization and primary PCI or in managing the immediate peri-thrombolysis time period.*

c. The CCU Attending should be notified before any procedures are performed on any CCU admissions.

d. Duty hours: In accordance with the rules of the ACGME, Cardiology fellows should work no more than 80 hours a week. The fellows should have an average of one day off a week (4 days off in a 28-day period). Furthermore, the fellow should not be on call more often than one day in three

(average call is much closer to one day in ten). On post-call days, the CCU fellow is to sign out to a previously designated covering fellow for CCU responsibilities from 1:00 to 5:00 p.m.

III. PROCESS OF CARE FOR THE EARLY MANAGEMENT OF PATIENTS PRESENTING TO THE BARNES-JEWISH HOSPITAL EMERGENCY DEPARTMENT (ED) WITH ACUTE ST-SEGMENT ELEVATION MYOCARDIAL INFARCTION (STEMI).

a. Following recognition of STEMI on the ECG, the ED Attending is to perform an expedited history and physical exam. The AMI management form is readily available in the ED to the Attending physician to facilitate specifically obtaining critical information regarding the patient's indications and contraindications for thrombolysis or cardiac catheterization, and to thereby facilitate the decision for and guide the optimal mode of immediate reperfusion therapy.

b. For patients with STEMI without contraindications for cardiac catheterization or percutaneous coronary intervention (PCI) who present to the hospital during the active hours of operation for the cardiac catheterization laboratory (Cardiac Procedure Center, or CPC), typically between the hours of 8:00 am and 6:00 pm on weekdays, primary PCI is recommended as the preferred mode of emergency reperfusion therapy. The ECG is faxed immediately by the ED to the CPC and the ED Attending physician should call the CPC (2-9300) to assess availability and to speak directly to an Interventional Cardiology Attending to refer the patient for emergency primary PCI *(goal = < 60 minutes from door to reperfusion by first balloon inflation, and <90 minutes from first medical contact).* It is expected that the data regarding that patient's potential contraindications for cardiac catheterization will have been completely acquired by the ED Attending prior to discussion with the Interventional Cardiologist. The ED should simultaneously activate the **AMI pager system (253-1579)**, and the CCU fellow should respond immediately to assist in preparing the patient for emergency cath and primary PCI if not previously accomplished by the FOD.

c. For patients with STEMI who are appropriate candidates without contraindications who present either **after hours or when the CPC is not available**, a decision to administer thrombolytic therapy *(goal = < 30 minutes from hospital arrival)* may be recommended at the discretion of the ED Attending physician, usually in telephone consultation with the Interventional Cardiologist on call. The **AMI pager system (253-1579)** should also be simultaneously activated, but the decision for immediate reperfusion by thrombolysis can be made without awaiting Cardiology response.

d. For patients with STEMI arriving after hours for whom primary PCI would be a preferable mode of emergency reperfusion (e.g., most patients), using the Doctors' Access Line (DAL) the ED Attending should activate the CPC on call team and AMI pager and simultaneously directly page the Interventional Cardiology Attending on call to discuss the case *(goal remains < 90 minutes to reperfusion by first balloon inflation).* It is again expected that the data regarding that patient's potential contraindications for cardiac catheterization will have been completely acquired by the ED Attending prior to discussion with the Interventional Cardiologist. *The on-call fellow is to be physically present in a timely manner to obtain informed consent for emergency cardiac cath and possible PCI, to accompany the patient to the CPC, and to assist in directing further evaluation and management.*

This process has been recommended in order to further expedite the process of care for STEMI at Barnes-Jewish Hospital, and has been approved by Interventional Cardiology, the Division of Cardiology, and the Division of Emergency Medicine. The AMI pager system will remain active and serve to involve Cardiology to assist in the early management of the patient with STEMI – to that end, the cardiology fellow carrying the AMI pager will continue to respond as rapidly as possible to facilitate the care of the patient. As always, data regarding the impact of these changes on performance measures will be rigorously collected and analyzed by the AMI Performance Improvement Committee.

IV. Educational Goals and Competencies of the CCU Rotation:

Patient Care:

- Expertise in management decisions regarding patients with suspected acute coronary syndromes (ACS). The fellow should be able to diagnose acute myocardial infarction, recognize indications and contraindications to particular therapies, and effectively triage the appropriate patient to acute reperfusion when indicated by thrombolytic therapy and/or acute primary percutaneous intervention.
- Expertise in proper use of medical therapy indicated for ACS, including thrombolytic agents, antiplatelet agents (e.g., ADP platelet receptor antagonists, glycoprotein IIb/IIIa inhibitors), anti-thrombotics (e.g., unfractionated and low molecular weight heparins, direct thrombin inhibitors, factor Xa antagonists), and combination regimens. Familiarity with the attendant risks and potential adverse reactions associated with these therapies.
- Expertise in the evaluation and management of post-MI complications (post-MI angina, mitral regurgitation, VSD, rupture).
- Expertise in the evaluation and management of arrhythmias, including post-MI arrhythmias. Recognition of the indications and contraindications for, and the technique of, electrical cardioversion.
- Expertise in recognizing appropriate indications for use of right heart and pulmonary artery hemodynamic monitoring and temporary transvenous pacemaker use. Competence in the safe placement of Swan-Ganz catheters, temporary pacemakers, and central venous lines, even in the setting of complex cardiovascular disease. Expertise in the interpretation of Swan-Ganz catheter hemodynamic waveforms and differentiation of the causes of shock or pulmonary congestion by analysis of the hemodynamic values and waveforms.
- Expertise in recognizing and managing cardiogenic shock, acutely decompensated congestive heart failure, accelerated hypertension, resuscitated sudden cardiac death, and pericardial tamponade. This includes recognizing indications and contraindications for, and acquiring competence in the performance of emergency procedures such as pericardiocentesis and intra-aortic balloon pump catheter insertion, and assessing potential need for advanced mechanical ventricular support.
- Expertise in the appropriate selection and application of a wide range of cardiovascular medications in the setting of critical care cardiology, including inotropic agents, vasopressors, vasodilators, beta blockers, nitrates, ACE inhibitors, calcium channel blockers, statins and anti-arrhythmic drugs.
- Expertise in determining appropriate risk stratification strategies for patients with ACS. Recognition of the indications for emergency and elective right and/or left heart catheterization as applicable to the varied patient populations with ACS, heart failure, and valvular heart disease in the CCU. Understanding of the appropriate selection application of non-invasive testing as applied to these acute care cardiac patients, including echocardiography, stress testing, and nuclear imaging techniques.

Medical Knowledge:

- Demonstrate an appropriate knowledge of the pathophysiology of acute coronary syndromes including ST elevation MI.
- Understand evidence-based practices for the use of thrombolytic therapy and IIb/IIIa inhibitors.
- Understand evidence-based practices of the use of ACE inhibitors, ß-blockers, and statins in acute coronary syndromes.
- **References: (Please note: all of the following are available at www.acc.org)**

O'Gara PT, Kushner FG, Ascheim DD, et al. 2013 ACCF/AHA Guideline for the Management of **ST-Elevation Myocardial Infarction**: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* 2013;61(4):e78-e140. doi:10.1016/j.jacc.2012.11.019.

Amsterdam EA, Wenger NK, Brindis RG, et al. 2014 AHA/ACC Guideline for the Management of Patients With **Non–ST-Elevation Acute Coronary Syndromes**: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* 2014;64(24):e139-e228. doi:10.1016/j.jacc.2014.09.017.

Thygesen K, Alpert JS, Jaffe AS, et al. **Third Universal Definition of Myocardial Infarction**. *J Am Coll Cardiol.* 2012;60(16):1581-1598. doi:10.1016/j.jacc.2012.08.001.

Rihal CS, Naidu SS, Givertz MM, et al. 2015 SCAI/ACC/HFSA/STS Clinical Expert Consensus Statement on the Use of **Percutaneous Mechanical Circulatory Support Devices** in Cardiovascular Care: Endorsed by the American Heart Association, the Cardiological Society of India, and Sociedad Latino Americana de Cardiologia Intervencion; Affirmation of Value by the Canadian Association of Interventional Cardiology-Association Canadienne de Cardiologie d'intervention∗. *J Am Coll Cardiol.*2015;65(19):e7-e26. doi:10.1016/j.jacc.2015.03.036.

Yancy CW, Jessup M, Bozkurt B, et al. 2013 ACCF/AHA Guideline for the Management of **Heart Failure**: A Report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines.*J Am Coll Cardiol.* 2013;62(16):e147-e239. doi:10.1016/j.jacc.2013.05.019.

Nishimura RA, Otto CM, Bonow RO, et al. 2014 AHA/ACC Guideline for the Management of Patients With **Valvular Heart Disease**: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Am Coll Cardiol.* 2014;63(22):e57-e185. doi:10.1016/j.jacc.2014.02.536.

Zipes DP, Camm A, Borggrefe M, et al. ACC/AHA/ESC 2006 Guidelines for Management of Patients With **Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death**: A Report of the American College of Cardiology/American Heart Association Task Force and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Develop Guidelines for Management of Patients With Ventricular Arrhythmias and the Prevention of Sudden Cardiac Death). *J Am Coll Cardiol.*2006;48(5):e247-e346. doi:10.1016/j.jacc.2006.07.010.

January CT, Wann L, Alpert JS, et al. 2014 AHA/ACC/HRS Guideline for the Management of Patients With **Atrial Fibrillation**: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. *J Am Coll Cardiol.* 2014;64(21):e1-e76. doi:10.1016/j.jacc.2014.03.022.

Strickberger S, Benson D, Biaggioni I, et al. AHA/ACCF Scientific Statement on the Evaluation of **Syncope**: From the American Heart Association Councils on Clinical Cardiology, Cardiovascular Nursing, Cardiovascular Disease in the Young, and Stroke, and the Quality of Care and Outcomes Research Interdisciplinary Working Group; and the American College of Cardiology Foundation In Collaboration With the Heart Rhythm Society.*J Am Coll Cardiol.* 2006;47(2):473-484. doi:10.1016/j.jacc.2005.12.019.

Practice-based Learning and Improvement:

- All fellows should understand the limitations of their knowledge and judgment – they must understand when help is needed.
- Accept feedback and learn from their errors.
- The fellows will demonstrate self-motivation to access information technology germane to the cases in the CCU.
- The fellows are expected to participate in quality improvement initiatives relative to acute MI.

Interpersonal and Communication Skills:

- The fellows will demonstrate caring and respectful behavior with patients and families.

- The fellows will conduct respectful discussions of advance directives and code status.
- The fellows will facilitate the learning of residents and health care professionals.

Professionalism:

- Demonstrate respect, compassion and integrity.
- Demonstrate a commitment to excellence and ongoing professional development.
- Demonstrate a commitment to ethical principles pertaining to confidentiality of patient information, informed consent, and other aspects of patient care.
- Develop an appreciation for the ethical, cultural, and socioeconomic dimensions of illness.
- Fellows should display initiative and leadership.

System-based Practices:

- Work effectively with nurses, secretaries, social workers, and other members of the healthcare team.
- Advocate for quality patient care in a complex system of residents, interns, attendings, and consultants.

Teaching Methods:

- The fellows will participate and help direct the bedside work/teaching rounds which start daily at 7:30 to 8:30 am.
- The fellows will help the interns and residents gather the data necessary to discuss the pathophysiology of illness and therapeutic plan of each patient.
- The fellows will review all necessary ECGs, echocardiograms, x-rays, and cardiac catheterizations with the residents and attendings.

Method of Evaluation:

- Fellow performance: The attendings will discuss the expectation with the fellow at the beginning of each 2 week block. At the end of each 2-week block, the attending will give verbal feedback to the fellow. At the end of the rotation, one attending, after consultation with the other attendings, will complete the evaluation on *MyEvaluations.com*. In addition, we will utilize a 360º review by the nursing staff to help assess professionalism and communication skills.